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S/N 09/997,530

DEC 04 2006

REMARKS:

I. Status of the Application.

Following entry of the above amendments, claims 1 – 5, 7 – 57, 59 – 80, 82 – 89, 101 – 116, 118 – 121, and 123 – 143 remain pending.

5 In the June 5, 2006 Office Action (the “Office Action”), the claims were rejected, in various combinations: (1) on the grounds of nonstatutory double-patenting over various copending applications or related, issued patents (Office Action points 2 – 7); (2) as directed to non-statutory subject matter under Section 101 (Office Action points 8 and 9); (3) for independent claims, as obvious under Section 103(a) based on
10 Wise U.S. Patent No. 5,768,561 (“Wise” or the “Wise reference”) in view of Baxter U.S. Patent No. 5,794,062 (“Baxter” or the “Baxter reference”) (Office Action points 10 – 62, 70 – 75); (4) for various dependent claims, as obvious under Section 103(a) over Wise in view of Baxter in further view of Lee et al. U.S. Patent No. 5,873,045 (“Lee” or the “Lee reference”) (Office Action points 63 – 65); (5) for various dependent claims, as obvious
15 under Section 103(a) over Wise in view of Baxter in further view of Cohen et al. U.S. Patent No. 6,005,943 (“Cohen” or the “Cohen reference”) (Office Action points 66 – 67); and (6) for independent claim 129, as anticipated under Section 102 over Wise (Office Action points 68 – 69).

20 In this response, Applicants have amended claims 1 – 3, 14, 17, 20, 23, 25 – 29, 32 – 34, 45, 48, 49, 51, 53 – 57, 62 – 65, 69, 75, 85, 89, 91 – 94, 102 – 104, 106 – 110, 113, 114, 118, 119, 125, 126, 129 – 131, 135, 136, and 139. Support for the amendments may be found throughout the specification, and in the particular sections cited below. In the interests of brevity, Applicants will not address references previously discussed at length in the First Amendment and Response, such as the Wise and Lee
25 references, and will not separately address the dependent claims. Applicants respectfully traverse the rejection of the various claims under Sections 101, 102 and 103(a). Applicants respectfully request reconsideration of the pending claims in view of the foregoing amendments and the following remarks.

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II. The Rejection of Various Claims for Non-Statutory Double-Patenting Should Be Withdrawn.

Claims 1, 32, and 129 were provisionally rejected for nonstatutory obviousness-type double-patenting over a related and commonly-owned case, Serial No. 09/997,987, filed concurrently with this application on November 30, 2001, which was published as Publication No. US 2003/0105949, is now issued U.S. Patent No. 6,986,021, and for which a continuation application is pending, Serial No. 11/241,009, published as Publication No. US 2006/0031660 (Office Action points 2 – 7).

Concurrently herewith, Applicant has submitted a terminal disclaimer for issued U.S. Patent No. 6,986,021, which should be sufficient for all of the cited, related applications and now issued patent. Accordingly, the nonstatutory obviousness-type double-patenting rejections should be withdrawn.

III. The Rejection of Claims 32 and 63 as Non-Statutory Should Be Withdrawn.

In the Office Action, independent claims 32 and 63 rejected as directed to non-statutory subject matter (Office Action points 8 and 9). In light of the amendments providing that the methods pertain to operation of an integrated circuit and utilize structures within the integrated circuit, the claims are now limited to tangible embodiments, and the Section 101 rejection is not longer applicable and should be withdrawn.

IV. The Rejection of the Claims Under Sections 102 and 103 Should Be Withdrawn.

In the Office Action, the pending independent and various dependent claims were rejected, in various combinations, as anticipated under Section 102 or obvious under Section 103(a) based on the Wise reference, or Wise in view of Baxter, with other dependent claims rejected in various combinations based on Wise in view of Baxter in further in view of the Lee reference, and Wise in view of Baxter in further view of Cohen (Office Action points 10 – 75). For the reasons stated below, Applicants respectfully traverse the rejection of the claims under Sections 102 and 103(a), and request that the Examiner withdraw the rejection of these claims and further allow all

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pending claims 1 – 5, 7 – 57, 59 – 80, 82 – 89, 101 – 116, 118 – 121, and 123 – 143. As discussed in greater detail below, the cited references do not disclose and do not suggest all the limitations of the claimed invention and, in addition, teach away from the claimed invention.

5 **A. The Claimed Invention is not Disclosed or Suggested by the Cited References.**

 The Patent Office has admitted that the Wise reference does not disclose claimed features of the present invention, particularly routing elements, and therefore
10 also does not disclose the use of routing elements in an interconnection network and an interconnection network for configurable or adaptive computing (Office Action point 1). The Patent Office has also admitted that Wise does not disclose the use of the same interconnection network structure for both the transfer of data and configuration information (Office Action point 32). As discussed in greater detail below, one or both
15 of these features is included in each independent claim and, therefore, the claims are not and cannot be anticipated by the Wise reference.

 The Baxter reference also does not disclose the use of routing elements. Rather, Baxter only discloses the use of circuit-switching elements, namely, cross-bar switches and multiplexers. While using the terminology “routing”, the Baxter reference
20 does so in the same sense that a telephone call is “routed” from New York City to Los Angeles over the public switched telephone network (PSTN) *solely through circuit-switched connections*, and not in the sense of being “routed” through data routers, such as voice over Internet Protocol (VoIP). The applicants have examined every reference in Baxter to such switching, and as itemized below, *every* such reference refers solely to
25 circuit-switching, not routing, and the *only* interconnection structures disclosed in Baxter are cross-bar switches and multiplexers for circuit-switching. The lack of any routing elements in Baxter is further evidenced by the lack of any discussion whatsoever in Baxter for any structure or methodology for one interconnect node determining a successive node in the interconnection network for routing of data or configuration,
30 which would be expected for any type of routing structure, rather than a circuit switching structure – so Baxter unambiguously did not contemplate actual routing, such as packet routing. (Conversely, corresponding addressing schemes for data and configuration

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transfer are discussed at length with reference to Figure 1 in the applicants' related patent application, now issued U.S. Patent No. 6,986,021).

Another significant feature of the claimed invention that is not disclosed or suggested in either Baxter or Wise is the "nested" or "multi-tiered" interconnection network structure and corresponding configurability at multiple levels, such as illustrated in Figure 4 of the present application and specification p. 14, ll. 3 – 19. For example, an entire matrix may be configured through a first level of interconnect for a discrete cosine transformation function, with the larger, system IC further configurable using a higher, second level of interconnection, such that the DCT is implemented as part of a selected operating mode, such as for a streaming video decoding. Continuing with the example, nothing in Baxter or Wise discloses or suggests that through additional selective routing of data and configuration, an already configured matrix (such as configured through circuit switching) can be further configured for implementation of different operating modes of the larger system. In contrast, for example, Baxter utilizes a completely flat interconnection mesh having no levels, as illustrated in Baxter Figure 16.

Another significant feature of the claimed invention, that results from the use of this "nested" or "multi-tiered" interconnection structure, is that one level of the interconnection network can be utilized to selectively configure another level of the interconnection network, such as in independent claim 129 as amended (see, e.g., specification p. 14, ll. 3 – 19). For example, the selective routing of configuration by one part of the interconnection network provides a configuration used by another part of the network. This claimed feature also is not disclosed or suggested in either Baxter or Wise.

As these features, in various combinations, are claimed in each of the independent claims, neither the Wise reference nor the Baxter reference, alone or in combination, discloses or suggests the present invention. More particularly, the present invention claims these features as follows:

1. Independent claims 1, 32, 63, 89, 91, and 93 claim (a) these multiple levels of an interconnection network structure, with (b) the interconnection network having both routing elements and switching elements. Claim 89 further claims different mixes of computational elements forming the configurable matrixes. Claim 91 further defines separate interconnection network switching

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structures within each plurality of computational elements. Claim 93 further defines a level of interconnection network structure coupled to an input output interface (Figure 2), and specifically claims routing of both data packets and configuration information packets.

5 2. Independent claim 94 specifically claims an interconnection network, for configuring computational elements in response to configuration information, with routing elements that route addressed data packets.

10 3. Independent claim 129 claims (a) these multiple levels of an interconnection network structure, with (b) a first level of the interconnection network selectively transferring data between computational elements, to provide the configuration, and (c) a second level of the interconnection network selectively transferring data to a selected computational element and further selectively transferring configuration information to the first level of the interconnection network. For example, one part of the interconnection network
15 then configures a second part of the interconnection network, which is a further feature that is not disclosed in the cited references.

20 4. Independent claim 139 claims different mixes of computational elements forming the configurable matrixes (see, *e.g.*, specification p. 21, ll. 1 – 29) and an interconnection network which provides both routing of data through routing elements and switching of data through switching elements.

B. The Baxter Reference Discloses Only Circuit-Switching Elements.

As mentioned above, the Baxter reference discloses only circuit-switching elements, consisting of cross- bar switches and multiplexers, with the only addressing
25 being memory location addressing and addressing to separately identify all the identical I/O units, as follows:

1. DOU cross-bar switch, Col. 7, ll. 23 – 25, 37 – 40;

2. AOU cross-bar switch, Col. 7, ll. 46 – 51, with memory addresses, ll. 63 – 65 and address multiplexer with store/count logic, Col. 8, ll. 5 – 8;

30 3. k-ary n-cube static interconnect network, Col. 8, l. 61, illustrated as a cross-bar switching fabric in Figure 16;

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4. DOU cross-bar switch, Col. 23, l. 14;

5. DOU cross-bar switch is a conventional cross-bar switch, Col. 23, ll. 35 – 42;

5 DOU cross-bar switch is a conventional cross-bar switch with bi-directional and unidirectional cross-bar couplings, Col. 24, ll. 4 – 7;

7. DOU cross-bar switch is for serial, not packet, data movement, Col. 24, ll. 14 – 15;

8. DOU cross-bar switch “routes” data between memory and RAM, ALU, etc, Col. 24, ll. 56 – 67, Col. 26, ll. 11 – 15;

10 9. Addresses are for memory locations for next program instructions, not packet data, Col. 27, ll. 17 – 18;

10. AOU cross-bar switch for serial address movement, not packet data, Col. 27, ll. 37 – 41;

15 11. AOU cross-bar switch and AOU multiplexer (also data selector multiplexer 250) “route” addresses between memory and RAM, and addresses calculations output by an arithmetic unit, Col. 28, ll. 21 – 34, Col. 29, l. 55 – Col. 30, l. 8;

20 12. The general purpose interconnect (GPIM) is a conventional interconnect mesh, Col. 34, ll. 50 – 54; illustrated as a cross-bar switching fabric in Figure 16; cross-bar switch is a conventional cross-bar switch with bi-directional and unidirectional cross-bar couplings, Col. 23, ll. 4 – 7, for serial, not packet, data movement;

13. Figure 8, first cross-bar switch 74;

14. Figures 9A and 9B, first cross-bar switch 150;

25 15. Figures 10 and 11B, second cross-bar switch 200;

16. Figures 11A and 11B, memory and register address multiplexer 206;

and

17. Figure 16, general purpose interconnect comprising switches 384 only.

30 Lacking any routing elements, the Wise and Baxter references teach away from the present invention. MPEP Section 2141.02. Such teaching away is the antithesis

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of art suggesting that a person of ordinary skill go in the claimed direction. See *In re Fine*, 873 F.2d 1071 (Fed. Cir. 1988). This teaching away from Applicants' invention is a *per se* and conclusive demonstration of lack of obviousness and a lack of anticipation.

Moreover, the patent office has not presented any motivation, suggestion
5 or teaching to combine any of these references. Accordingly, no *prima facie* showing of potential obviousness has been made, and any assertions to the contrary have been clearly rebutted. *In re Rouffet*, 149 F.3d 1350 (Fed. Cir. 1998); *In re Mills*, 916 F.2d 680 (Fed. Cir. 1990).

Accordingly, nothing in the Baxter reference discloses or suggests the use
10 of routing elements in an interconnection network for configuration of computational elements. Similarly, it is admitted that Wise does not disclose routing elements. In addition, neither reference discloses or suggests the other claimed features itemized above, such as the multiple levels of the interconnection network, and the use of one part of the multi-level interconnection network to configure another part of the
15 interconnection network. The Wise reference and the Baxter reference, alone or in combination, do not disclose and do not suggest these claimed features of the present invention and, accordingly, all independent claims as amended are not anticipated and are not rendered obvious by these references. All the independent claims 1, 32, 63, 89, 91, 93, 94, 129 and 139 are therefore allowable, and the rejection should be withdrawn.

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V. The Remaining References Do Not Disclose or Suggest the Claimed Invention.

The Lee reference pertains to use of cellular telephone for additional
purposes, such as a portable communication interface (wireless transceiver) for a
25 computer, using an intermediate structure referred to as a "holster", using the existing command structure of the particular cell phone. The Lee reference, therefore, is not relevant to adaptive, configurable or reconfigurable computing architectures and, more particularly, is not pertinent to the claimed present invention.

The Cohen reference is cited for decryption. Nothing in Cohen discloses
30 or suggests any of the claimed features of the invention concerning configurable or adaptive computing, or any motivation to apply the technology of Cohen in this area.

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An additional reference has come to Applicant's attention, Trimberger et al. U. S. Patent Nol. 5,646,545, which was cited in the Mohan reference discussed in the First Amendment and Response. Trimberger provides a memory which can be used for either data or configuration, and is otherwise duplicative of the material previously discussed for Baxter.

As a consequence, the Wise reference, alone or in combination with the Baxter, Lee, Cohen, or Trimberger references, does not anticipate and does not render obvious the claimed invention. The claimed invention, therefore, is allowable over the cited references.

VI. Summary.

None of the cited references disclose or suggest the claimed elements of the present invention. More specifically, the various references, alone or in combination with each other, do not disclose and do not suggest any of the following claimed elements: (1) an interconnection network comprising both routing elements and switching elements; (2) using routing elements for configuration; (3) "nested" or multiple levels of configuration; (4) using one level of a multi-level interconnection network to configure another level; (5) different mixes or combinations of different computational elements forming independently configurable groups; and (6) "self-routing" of data and configuration.

As a consequence, the cited references do not disclose and do not suggest the present invention. The present invention, therefore, is not anticipated and is not rendered obvious by these references under Sections 102 and 103, and the rejection of the claims should be withdrawn. In addition, because the remaining dependent claims incorporate by reference all of the limitations of the corresponding independent claims, all of the dependent claims are also allowable over the cited references.

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On the basis of the above amendments and remarks, reconsideration and allowance of the application is believed to be warranted, and an early action toward that end is respectfully solicited. In addition, for any issues or concerns, the Examiner is invited to call the attorney for the applicant at the telephone number provided below.

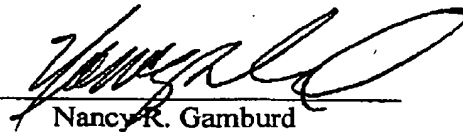
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Respectfully submitted,

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10 December 4, 2006

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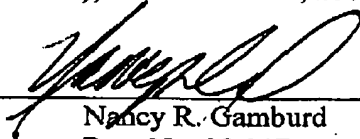
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CERTIFICATE OF FACSIMILE TRANSMISSION

I hereby certify that the foregoing Amendment And Response Under 37
CFR 1.111 And 1.115 (41 pages), Transmittal (PTO/SB/21) (1 page), Fee Transmittal
5 (PTO/SB/17) (1 page), Petition for Extension of Time (PTO/SB/22) (2 pages, original
plus 1 copy), and Terminal Disclaimer (PTO/SB/26) (46 total pages), for Paul L. Master
et al., Serial No. 09/997,530, entitled "Apparatus, System and Method For Configuration
Of Adaptive Integrated Circuitry Having Fixed, Application Specific Computational
Elements", have been transmitted by facsimile to the US Patent and Trademark Office to
10 fax number (571) 273-8300 (Centralized Facsimile Number), on December 4, 2006.


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